

CLAIMS:

Please amend claims 1, 7, 13 and 19.

Claims are as follows.

1. (Currently Amended) A method of forming a bond pad for use in a wirebond interconnection, comprising:

forming a first non-conductive layer in direct mechanical contact with a surface of a substrate, wherein the first non-conductive layer comprises a via extending down to the surface of the substrate;

depositing a first layer of bond pad material on a substrate in direct mechanical contact with a surface of the first non-conductive layer, wherein the first layer of bond pad material fills the via and extends beyond the via onto the surface of the first non-conductive layer; and

depositing a second layer of bond pad material on in direct mechanical contact with the first layer of bond pad material, wherein the first and second layers of bond pad material on the surface of the first non-conductive layer extending beyond the via form a bond pad region, and wherein the first layer of bond pad material has a higher Young's Modulus of Elasticity than the second layer of bond pad material;

depositing a second non-conductive layer over the second layer of bond pad material, wherein the second non-conductive layer is in direct mechanical contact with the bond pad region a surface of the second layer of bond pad material;

forming an opening within the second non-conductive layer down to the bond pad region of the second layer of bond pad material; and

forming a wirebond interconnection within the opening within the second non-conductive layer in mechanical and electrical connection with the second layer of bond pad material.

2. (Original) The method of claim 1, wherein the first layer comprises a material selected from the group consisting of: TiAl_x , an aluminum alloy having at least 2% titanium, an aluminum alloy having at least 2% copper, an aluminum alloy having at least 2% silicon, and an aluminum alloy having at least 2% tungsten; and the second layer comprises of a material selected from the group consisting of: aluminum, aluminum-copper alloys, and aluminum-titanium alloys.
3. (Previously Presented) The method of claim 1, wherein the Young's Modulus of Elasticity of the second layer is less than about 90 GPa, and the Young's Modulus of Elasticity of the first layer is at least about 100 GPa or greater.
4. (Previously Presented) The method of claim 1, wherein the first layer of bond pad material is more resistant to penetration by a probe tip during probe testing than the second layer of bond pad material.
5. (Previously Presented) The method of claim 1, wherein the first layer of bond pad material is more resistant to mechanical failure than the second layer of bond pad material during mechanical testing of the wirebond interconnection.

6. (Canceled).

7. (Currently Amended) A method of forming a bond pad for use in a wirebond interconnection, comprising:

forming a first non-conductive layer in direct mechanical contact with a surface of a substrate, wherein the first non-conductive layer comprises a via extending down to the surface of the substrate;

depositing a first layer of bond pad material on a substrate in direct mechanical contact with a surface of the first non-conductive layer, wherein the first layer of bond pad material fills the via and extends beyond the via onto the surface of the first non-conductive layer;

depositing a second layer of bond pad material on in direct mechanical contact with the first layer of bond pad material, wherein the first and second layers of bond pad material on the surface of the first non-conductive layer extending beyond the via form a bond pad region, and wherein a hardness of the first layer of bond pad material is greater than a hardness of the second layer of bond pad material;

depositing a second non-conductive layer over the second layer of bond pad material, wherein the second non-conductive layer is in direct mechanical contact with the bond pad region of the second layer of bond pad material;

forming an opening within the second non-conductive layer down to the bond pad region of the second layer of bond pad material; and

forming a wirebond interconnection within the opening in the second non-conductive layer in mechanical and electrical connection with the second layer of bond pad material.

8. (Previously Presented) The method of claim 7, wherein the hardness of the first layer is about 0.8 GPa and the hardness of the second layer is about 0.6 GPa.

9. (Original) The method of claim 7, wherein the first layer comprises a material selected from the group consisting of: $TiAl_x$, an aluminum alloy having at least 2% titanium, an aluminum alloy having at least 2% copper, an aluminum alloy having at least 2% silicon, and an aluminum alloy having at least 2% tungsten; and the second layer comprises of a material selected from the group consisting of: aluminum, aluminum-copper alloys, and aluminum-titanium alloys.

10. (Previously Presented) The method of claim 7, wherein the first layer of bond pad material is more resistant to penetration by a probe tip during probe testing than the second layer of bond pad material.

11. (Previously Presented) The method of claim 7, wherein the first layer of bond pad material is more resistant to mechanical failure than the second layer of bond pad material during mechanical testing of a the wirebond interconnection.

12. (Canceled).

13. (Currently Amended) A semiconductor device, comprising:

a first non-conductive layer in direct mechanical contact with a surface of a substrate,
wherein the first non-conductive layer comprises a via extending down to the surface of the
substrate;

a first layer formed on a substrate in direct mechanical contact with a surface of the
first non-conductive layer, wherein the first layer fills the via and extends beyond the via
onto the surface of the first non-conductive layer;

a second layer on in direct mechanical contact with the first layer, wherein the first
and second layers on the surface of the first non-conductive layer extend beyond the via to
form a bond pad region, wherein the first layer has a higher Young's Modulus of Elasticity
than the second layer;

a second non-conductive layer on in direct mechanical contact with the bond pad
region of the second layer having an opening within the second non-conductive layer down
to the bond pad region of the second layer; and

a wirebond interconnection within the opening within the second non-conductive
layer forming an electrical connection with the second layer.

14. (Original) The semiconductor device of claim 13, wherein the first layer comprises a material selected from the group consisting of: TiAl_x , an aluminum alloy having at least 2% titanium, an aluminum alloy having at least 2% copper, an aluminum alloy having at least 2% silicon, and an aluminum alloy having at least 2% tungsten; and the second layer comprises

of a material selected from the group consisting of: aluminum, aluminum-copper alloys, and aluminum-titanium alloys.

15. (Previously Presented) The semiconductor device of claim 13, wherein the first layer is more resistant to mechanical failure than the second layer during mechanical testing of the wirebond interconnection.

16. (Previously Presented) The semiconductor device of claim 13, wherein the first layer is more resistant to penetration by a probe tip during probe testing than the second layer.

17. (Previously Presented) The semiconductor device of claim 13, wherein the Young's Modulus of Elasticity of the second layer is less than about 90 GPa, and the Young's Modulus of Elasticity of the first layer is at least about 100 GPa or greater.

18. (Previously Presented) The semiconductor device of claim 13, wherein the hardness of the first layer is about 0.8 GPa and the hardness of the second layer is about 0.6 GPa.

19. (Currently Amended) The semiconductor device of claim 13, wherein the second non-conductive layer comprises an oxide layer.

20. (Canceled).